

FIG. 1A

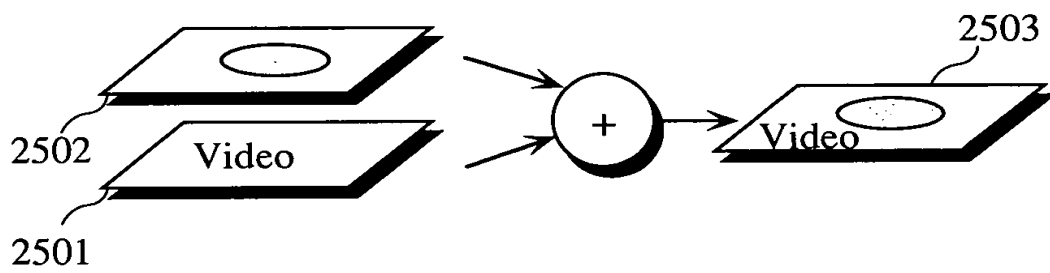


FIG. 1B

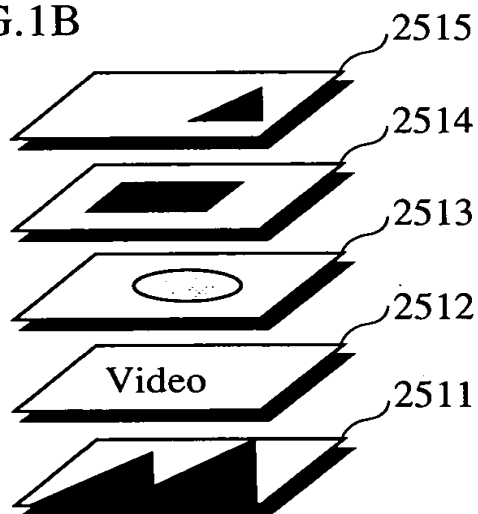


FIG.2

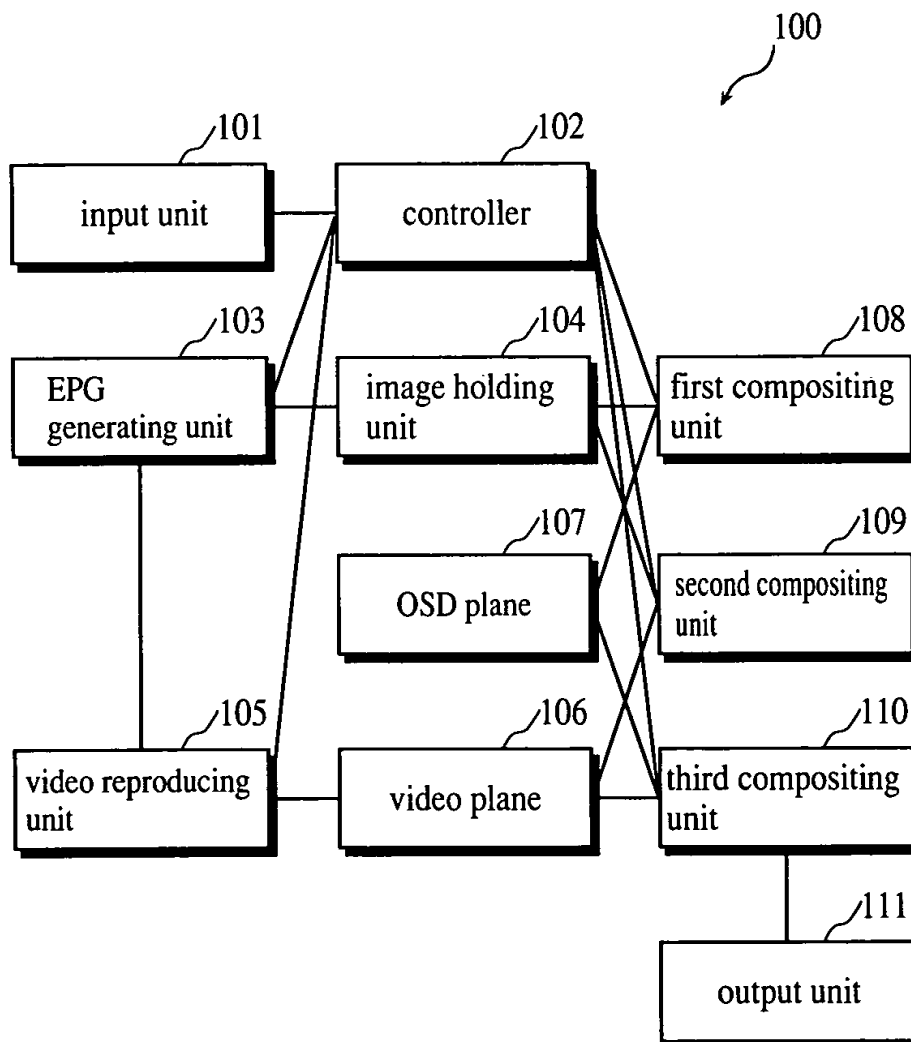


FIG.3A

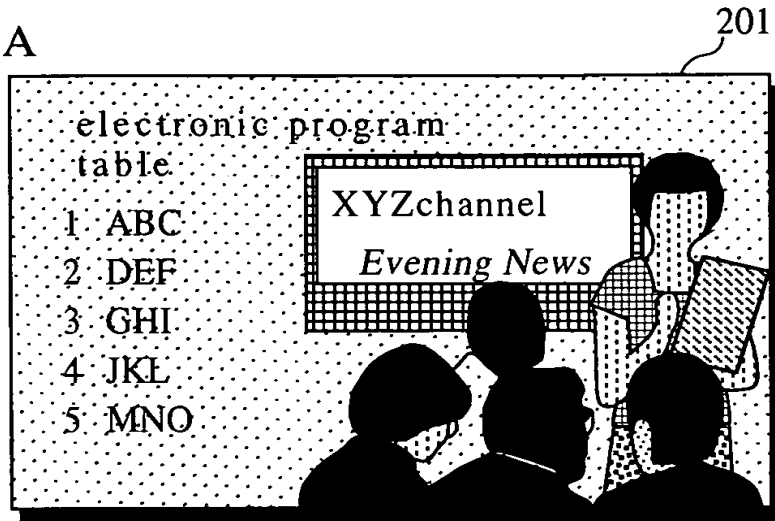


FIG.3B

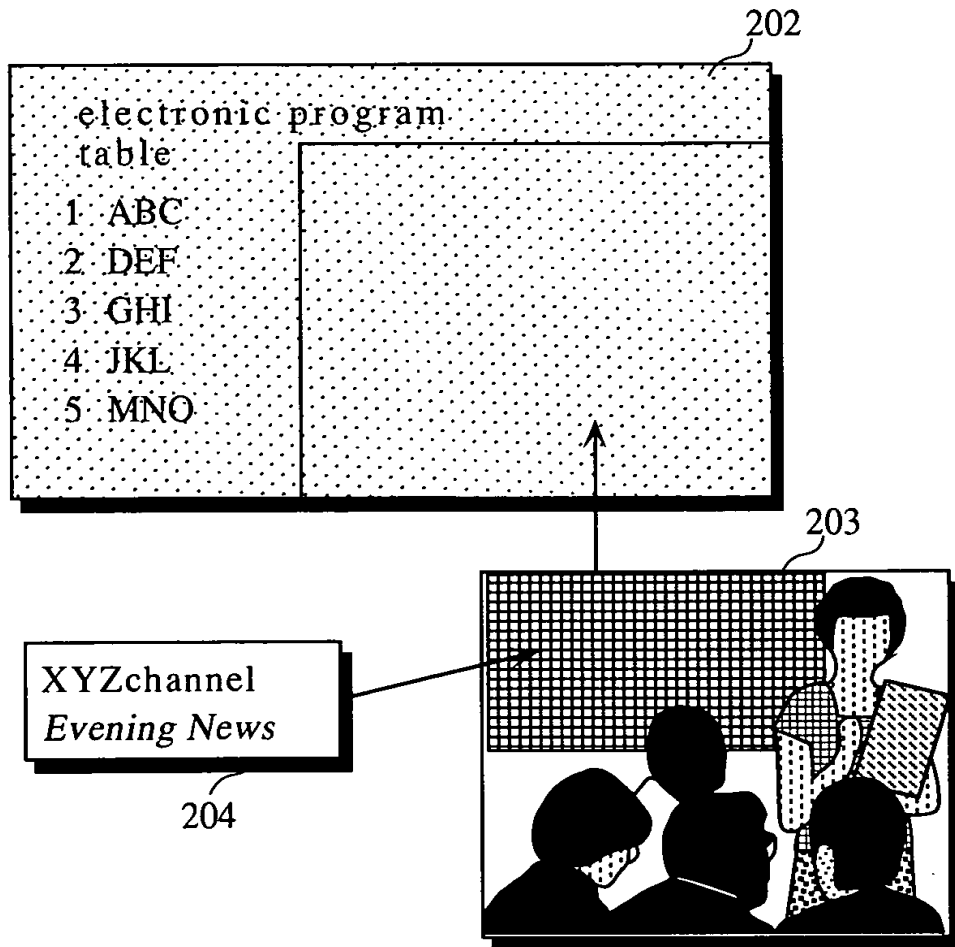


FIG. 4

FIG. 4

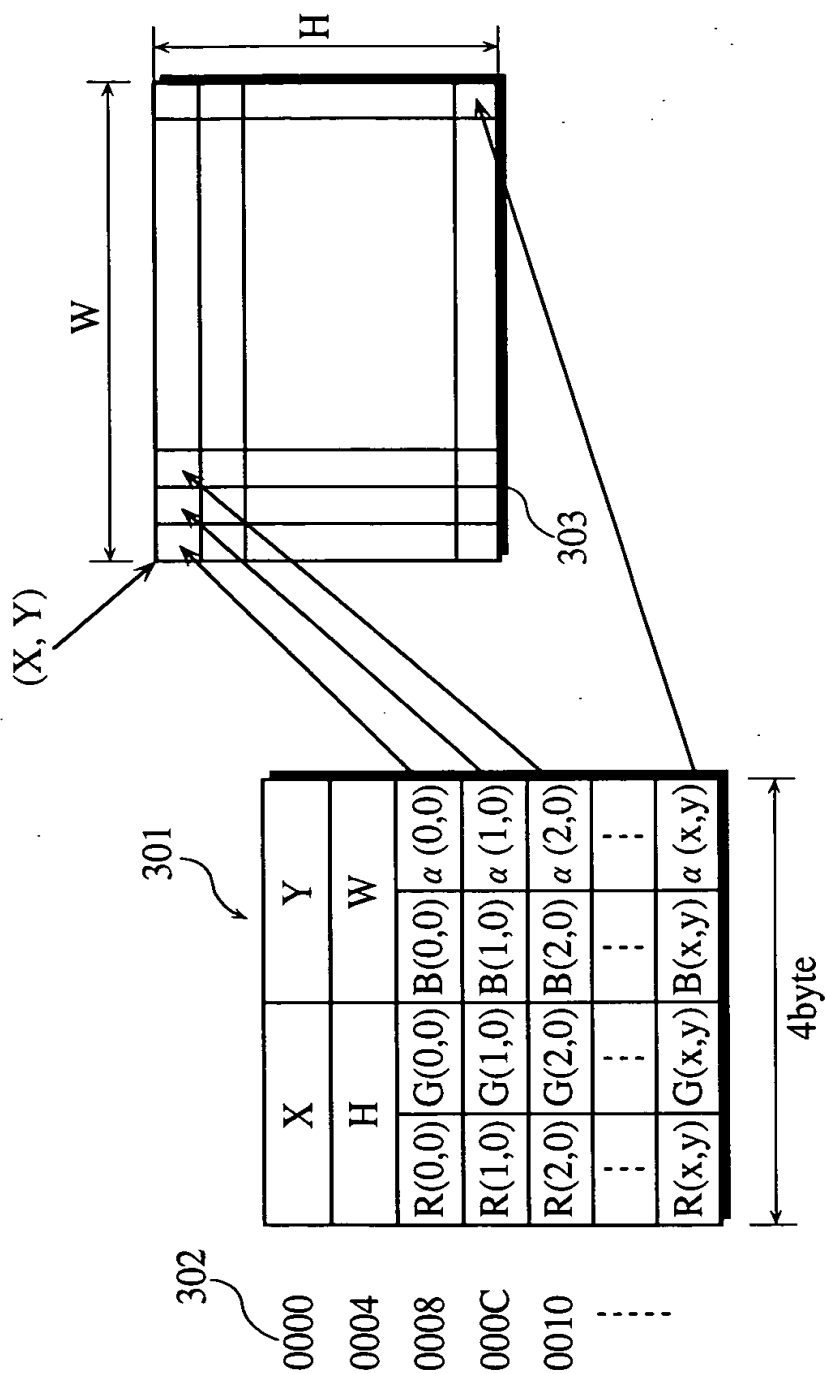


FIG. 5

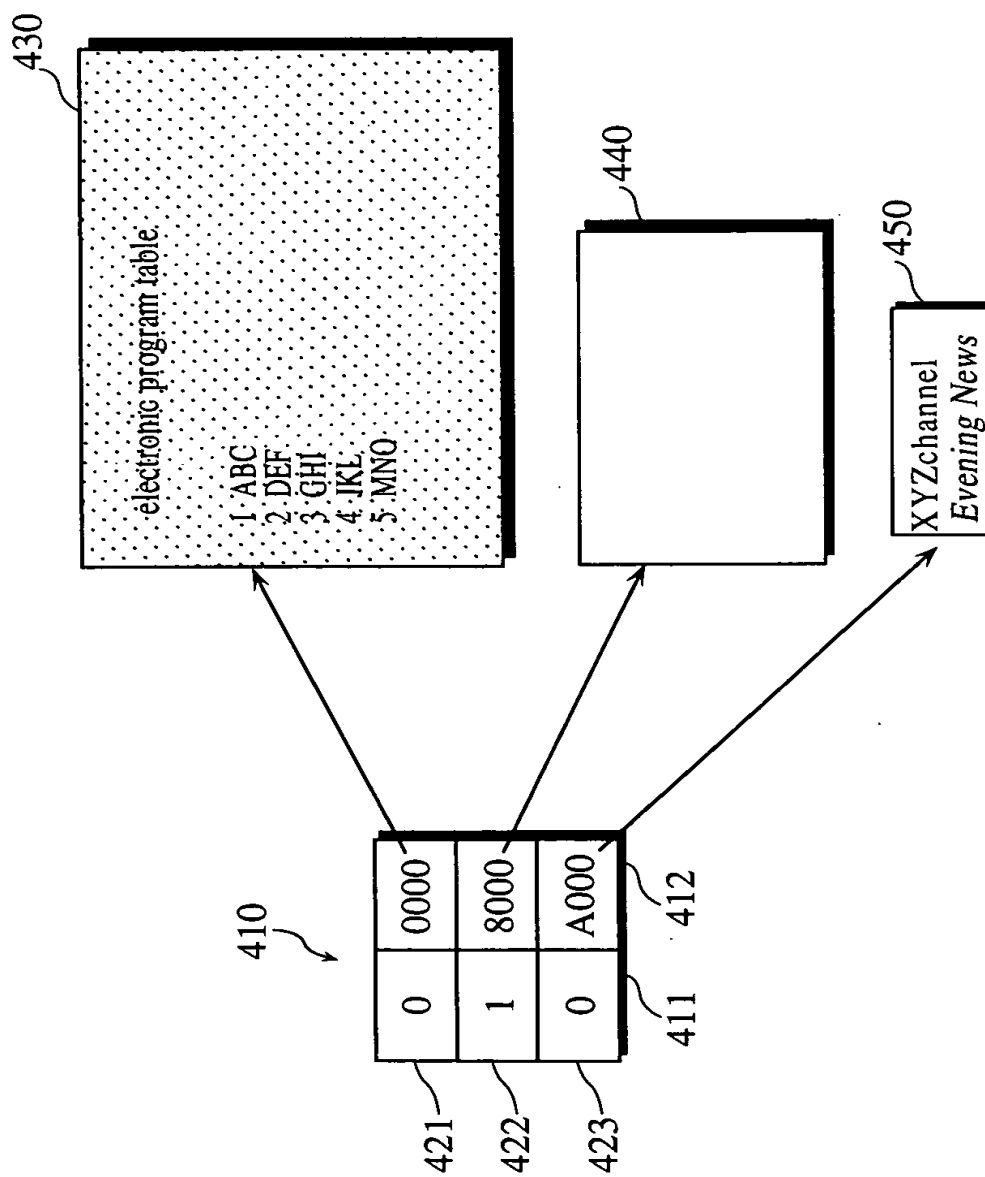


FIG.6

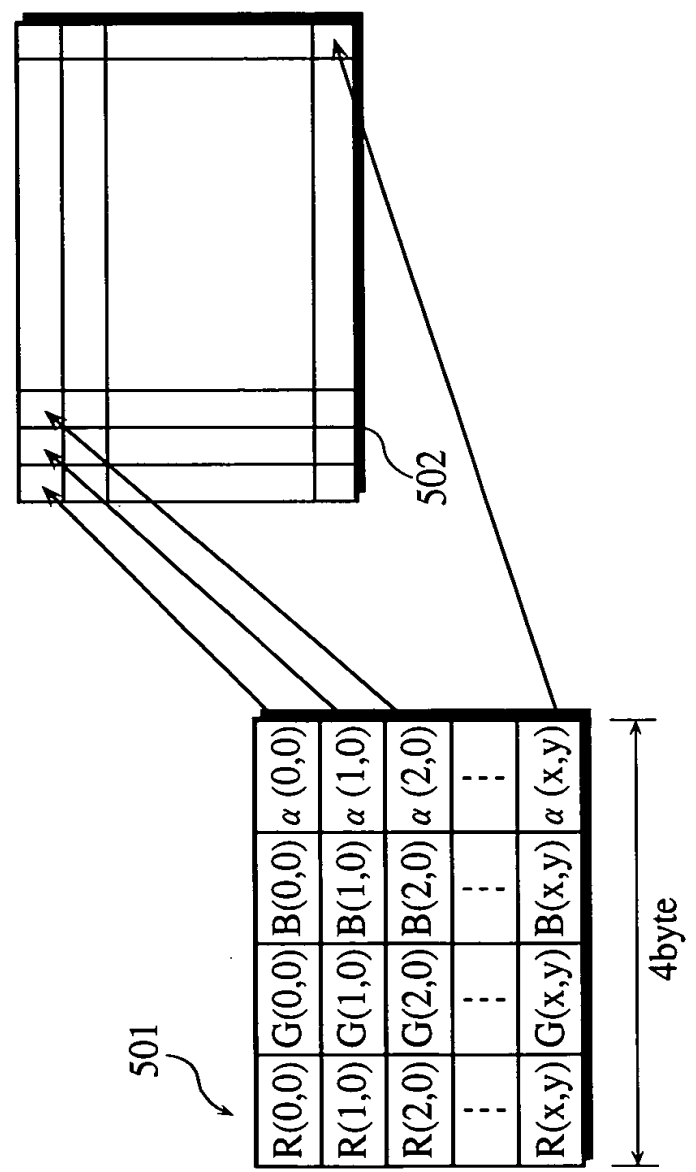


FIG. 7

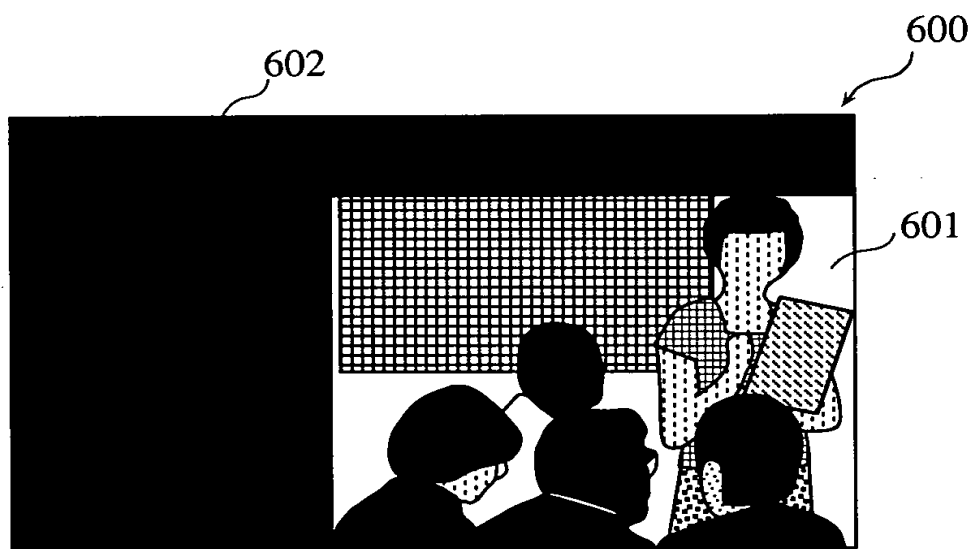


FIG. 8

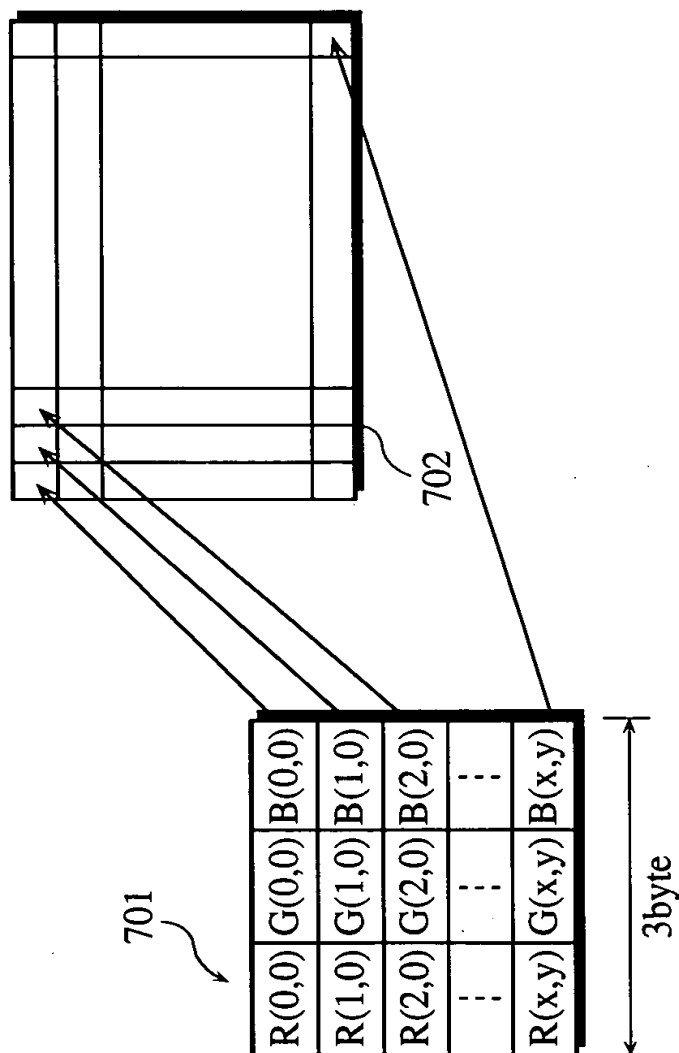


FIG. 8

FIG.9

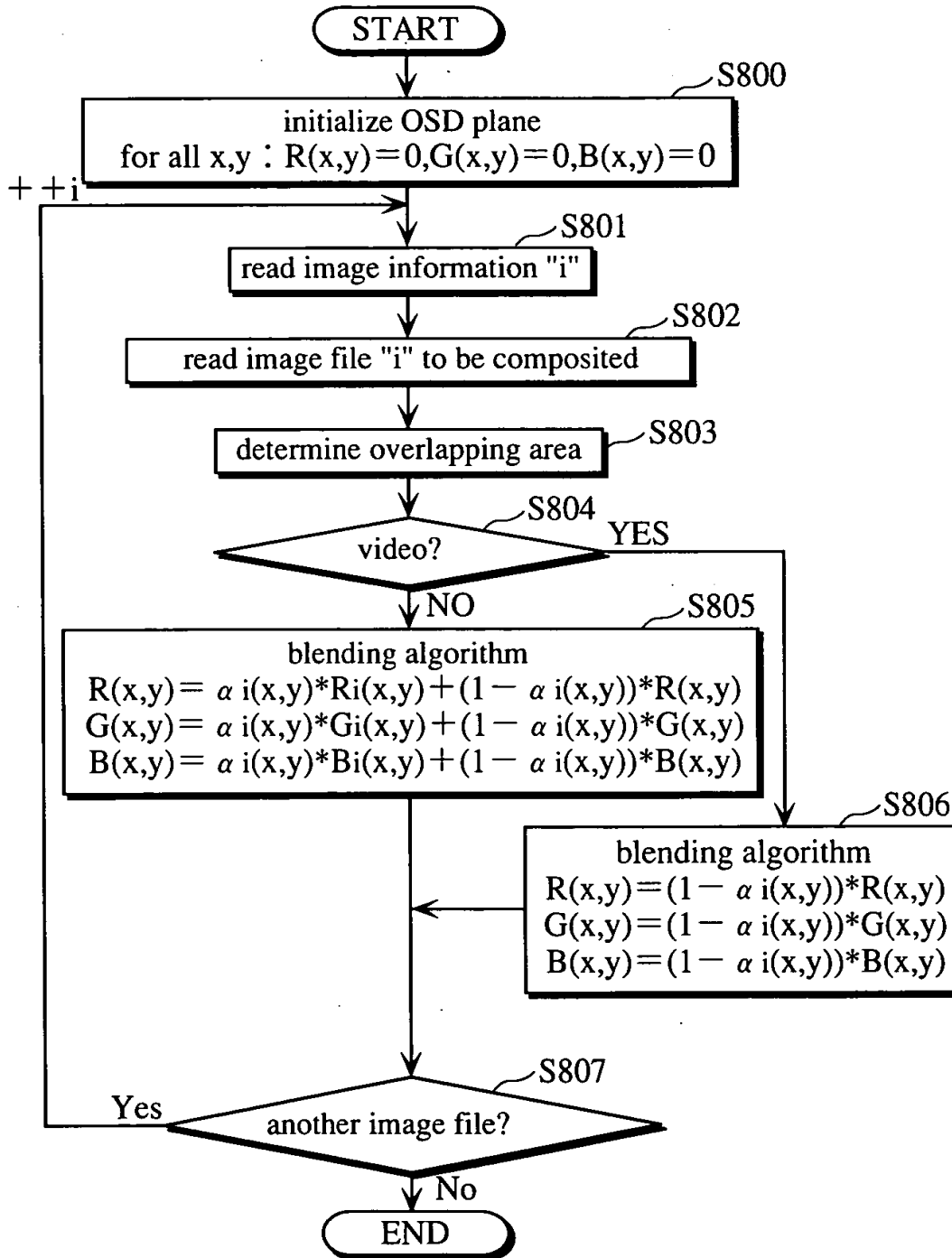


FIG.10

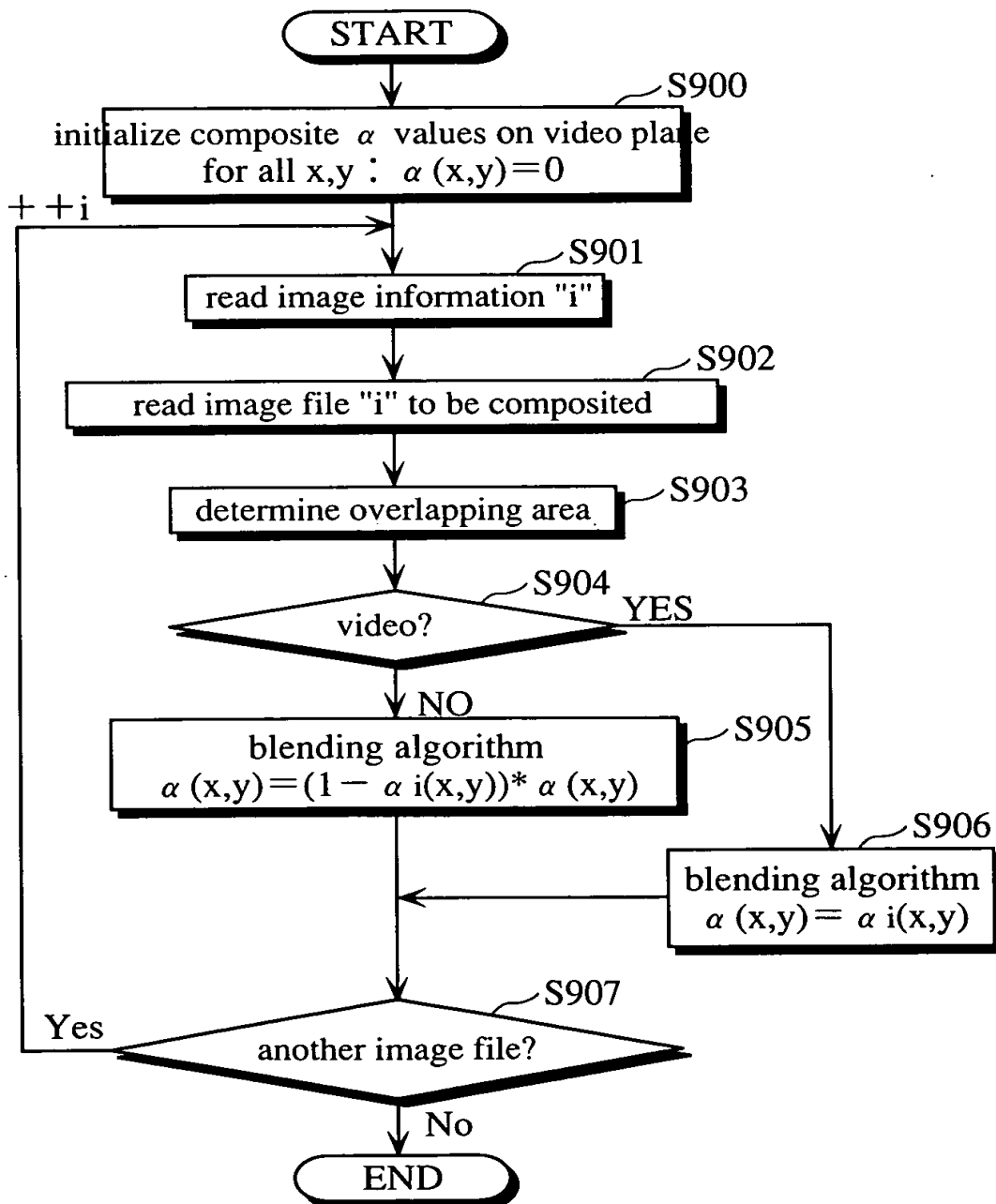


FIG.11

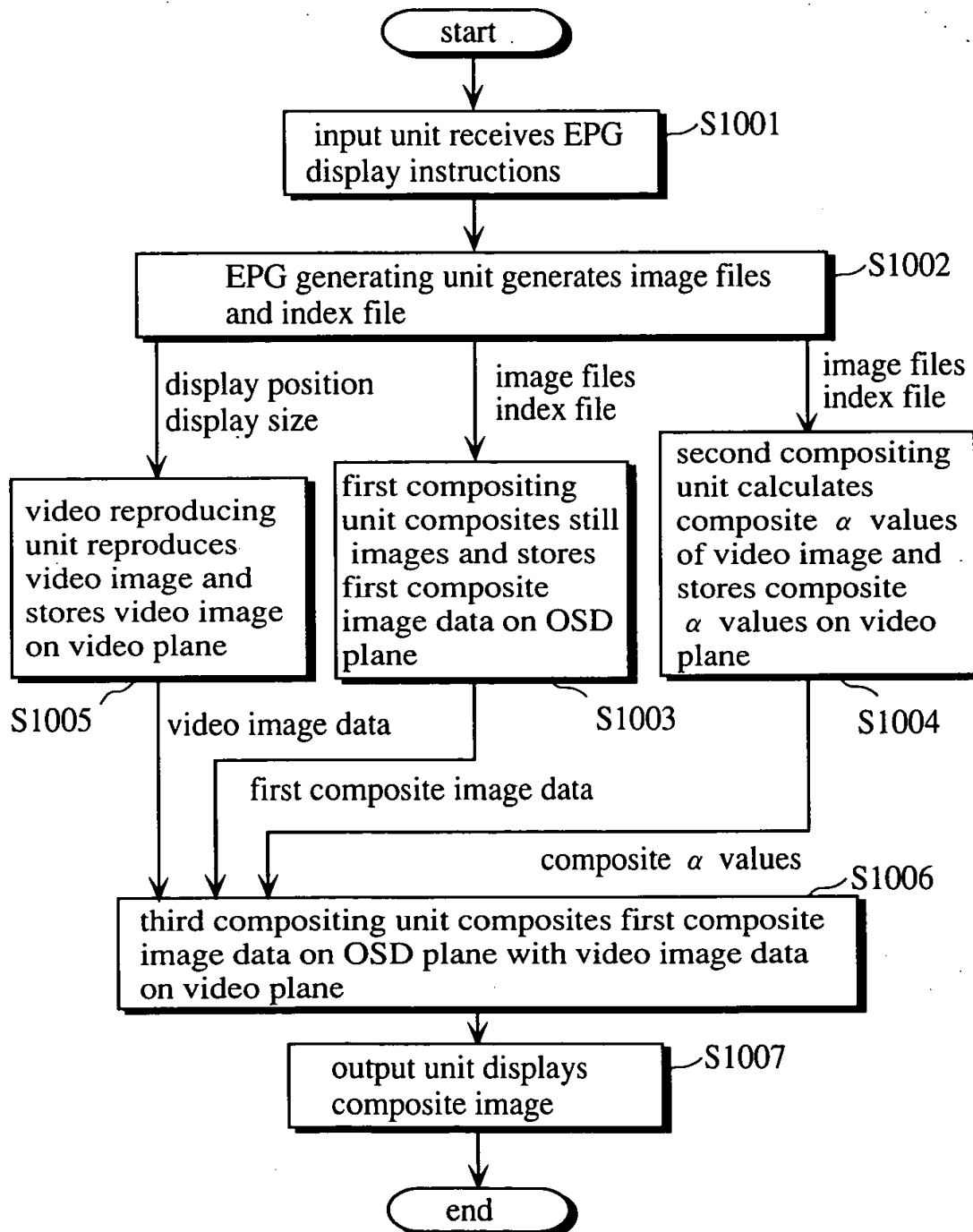


FIG.12

 R_N, G_N, B_N, α_N

⋮

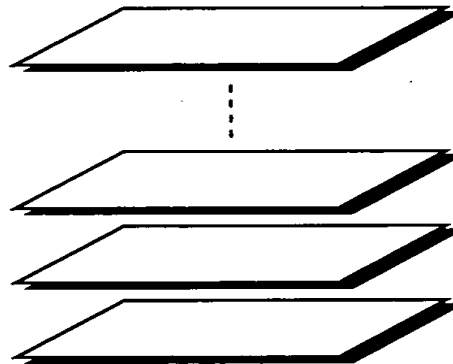
 R_2, G_2, B_2, α_2 R_1, G_1, B_1, α_1 R_0, G_0, B_0, α_0 

FIG.13

```

1      R=0 ;
2      G=0 ;
3      B=0 ;
4       $\alpha$  =0 ;
5      for (i=0 ; i<=N ; i++ ) {
6          if (VIDEO=component i) {
7              R=(1- $\alpha$  i)*R ;
8              G=(1- $\alpha$  i)*G ;
9              B=(1- $\alpha$  i)*B ;
10              $\alpha$  =  $\alpha$  i ;
11         } else {
12             R=  $\alpha$  i*Ri+(1- $\alpha$  i)*R ;
13             G=  $\alpha$  i*Gi+(1- $\alpha$  i)*G ;
14             B=  $\alpha$  i*Bi+(1- $\alpha$  i)*B ;
15              $\alpha$  =  $\alpha$  *(1- $\alpha$  i) ;
16         }
17     }
18     R=R+  $\alpha$  *Rv ;
19     G=G+  $\alpha$  *Gv ;
20     B=B+  $\alpha$  *Bv ;

```

FIG.14

```

[program 1]
1      R=0 ;
2      G=0 ;
3      B=0 ;
4       $\alpha = 0$  ;
5      for (i=0 ; i<=N ; i++) {
6          if (VIDEO=component i) {
7              R=(1- $\alpha$  i)*R ;
8              G=(1- $\alpha$  i)*G ;
9              B=(1- $\alpha$  i)*B ;
10              $\alpha = \alpha$  i ;
11         } else {
12             R= $\alpha$  i*Ri+(1- $\alpha$  i)*R ;
13             G= $\alpha$  i*Gi+(1- $\alpha$  i)*G ;
14             B= $\alpha$  i*Bi+(1- $\alpha$  i)*B ;
15              $\alpha = \alpha$  *(1- $\alpha$  i) ;
16         }
17     }
[program 2]
1      while(true) {
2          R=R+ $\alpha$  *Rv ;
3          G=G+ $\alpha$  *Gv ;
4          B=B+ $\alpha$  *Bv ;
5      }

```

FIG.15

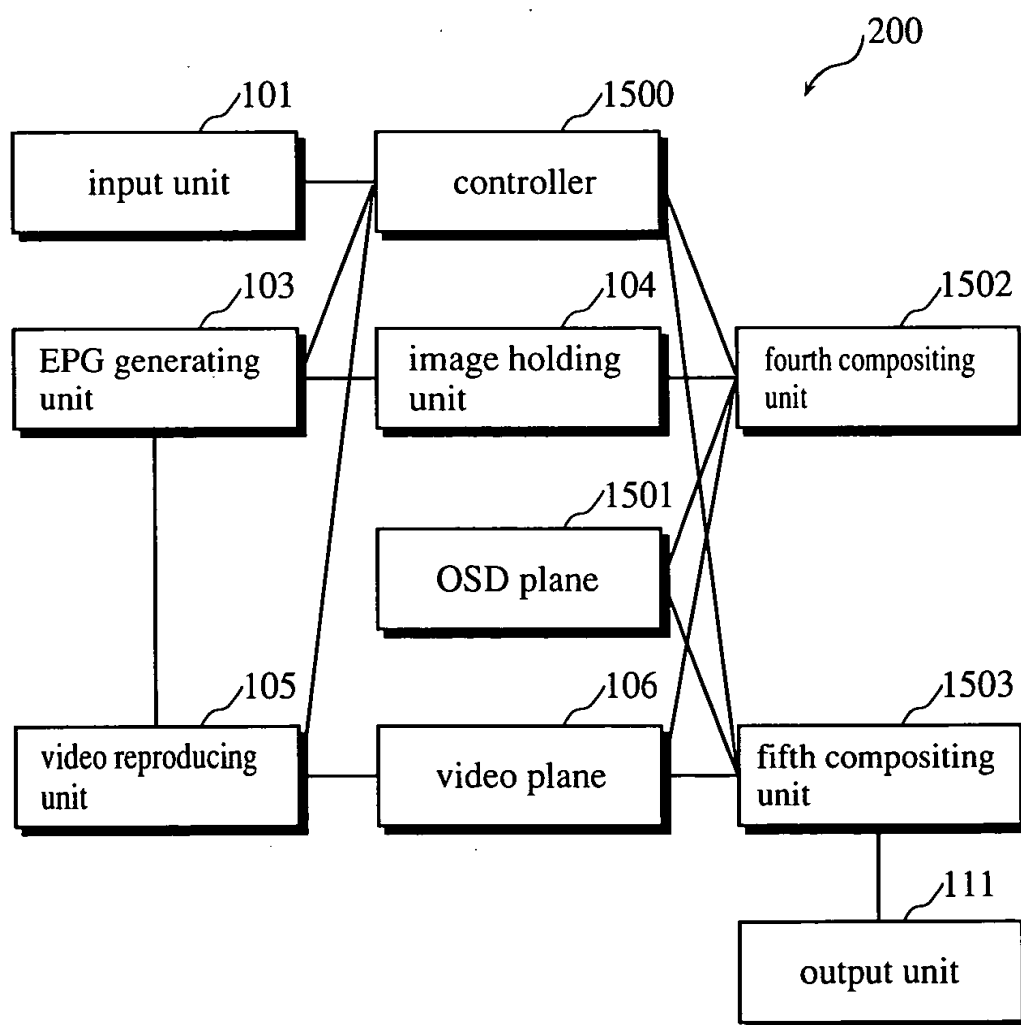


FIG.16

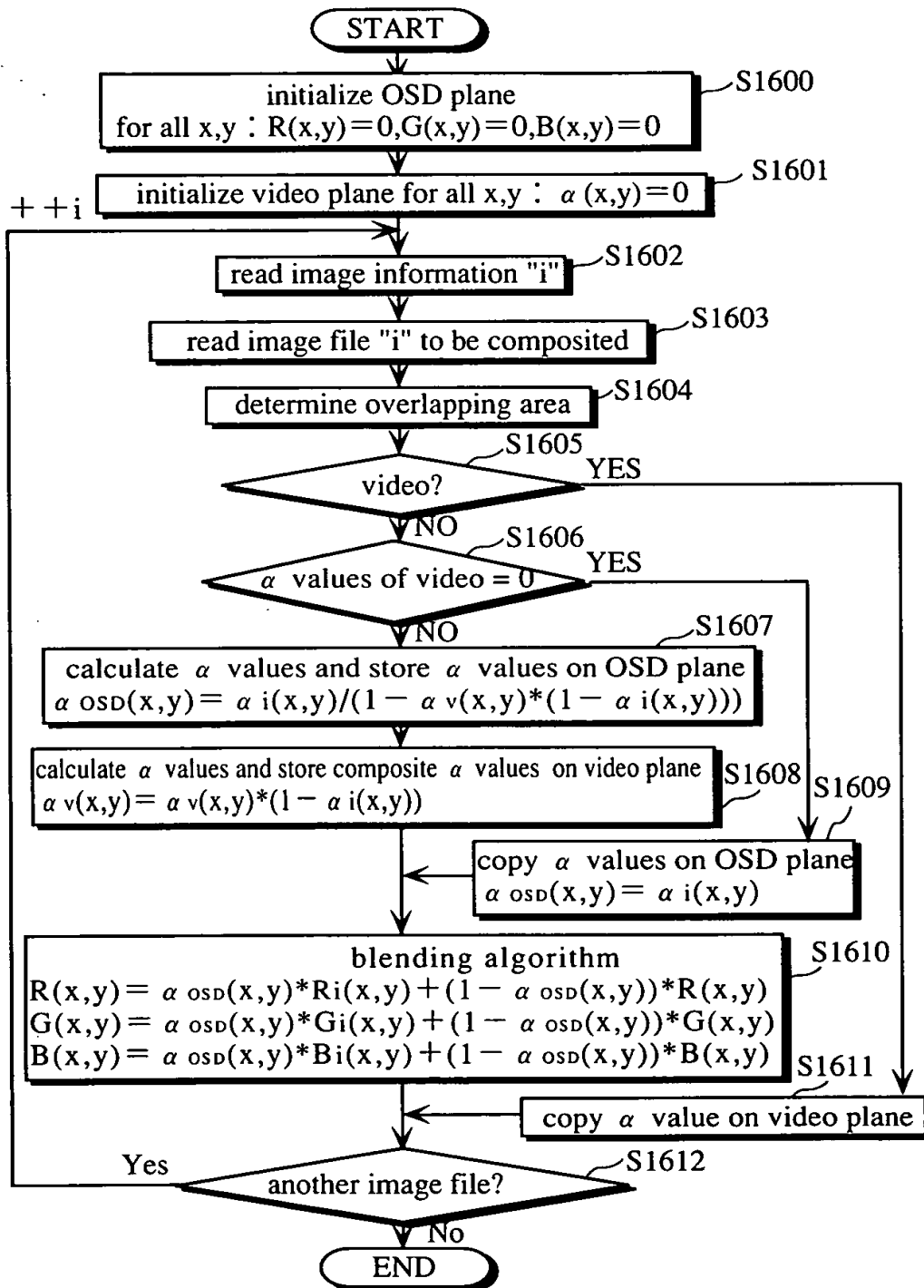


FIG. 17

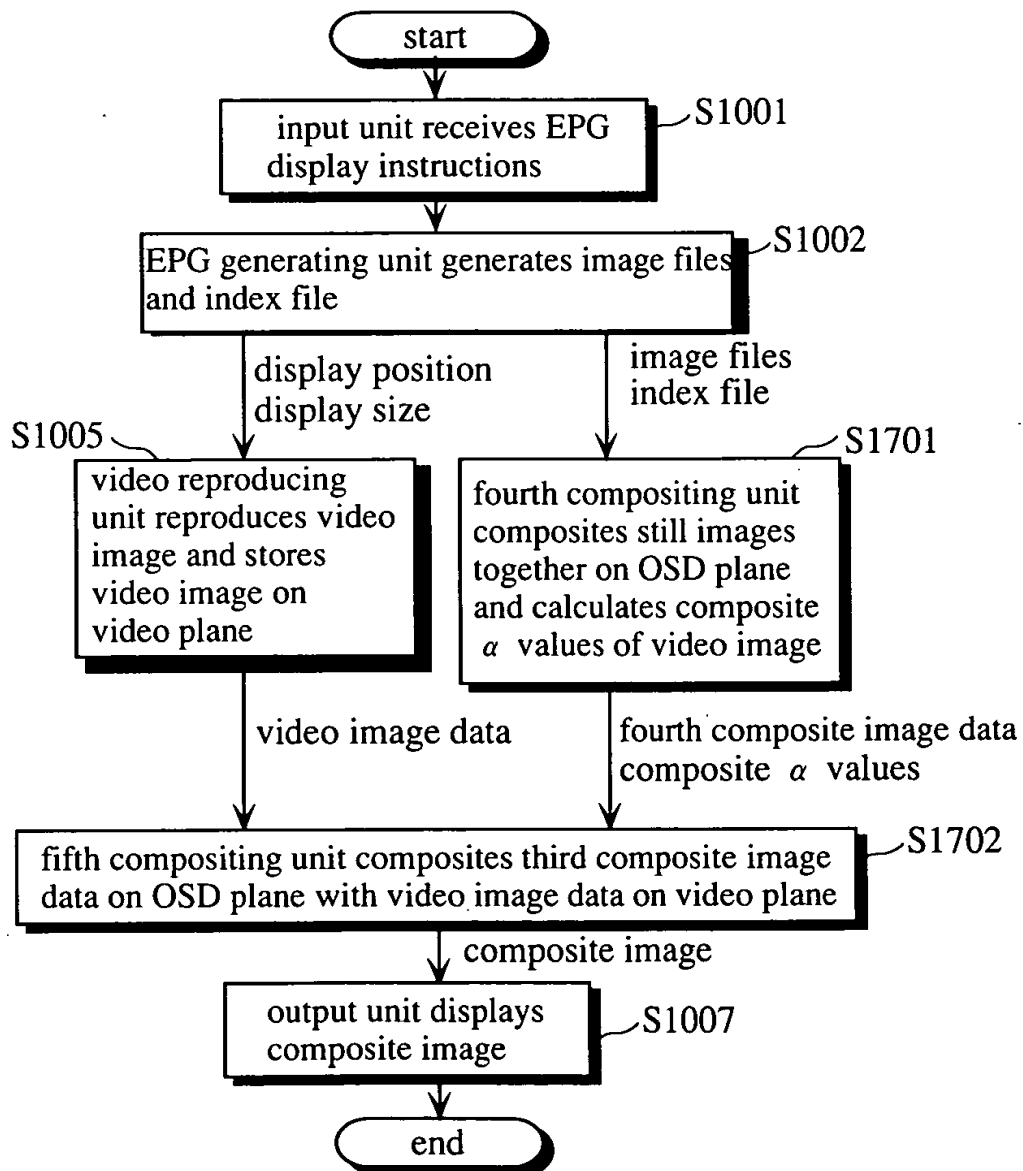


FIG.18

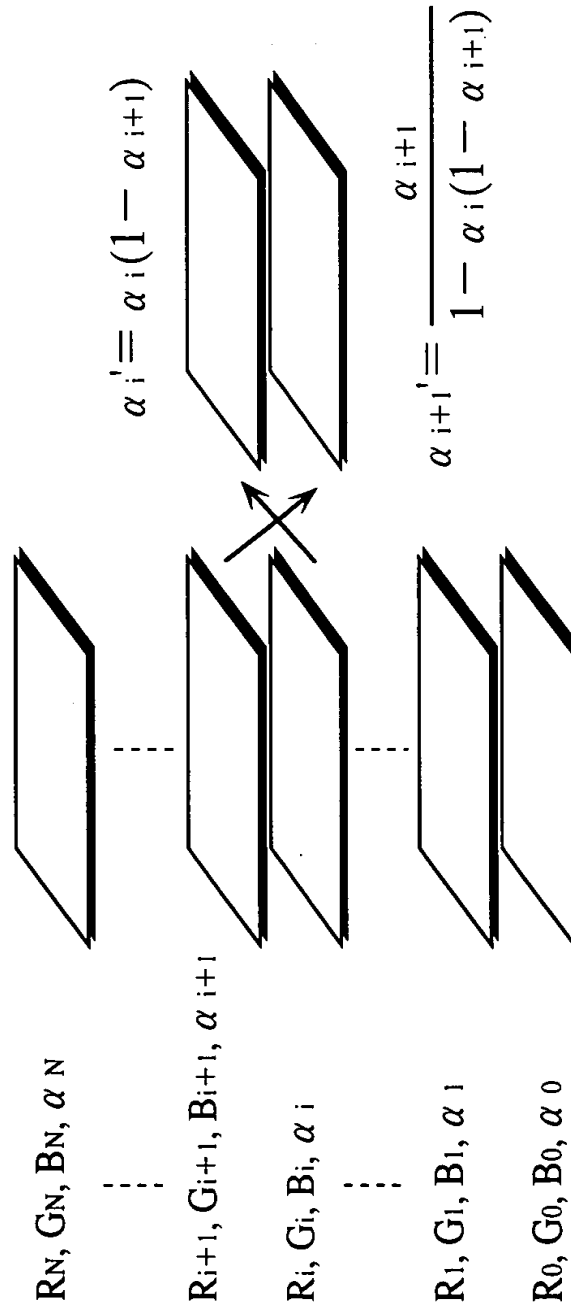


FIG.19

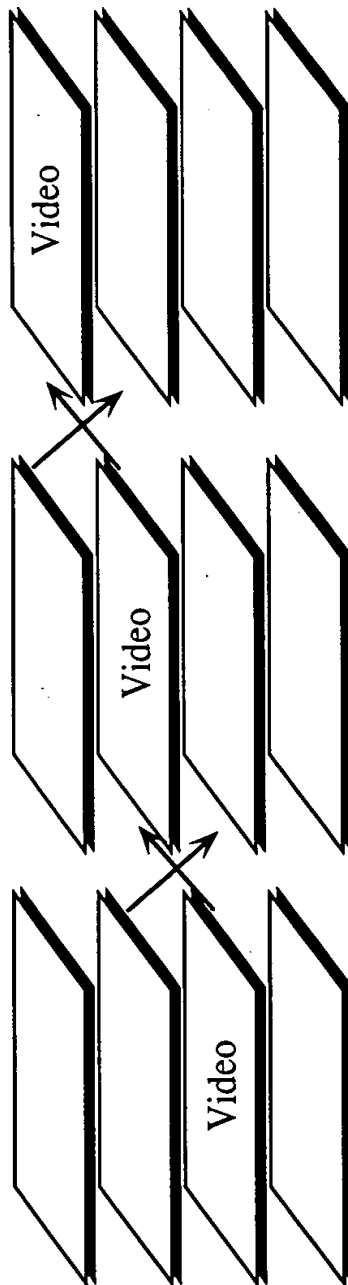


FIG.20

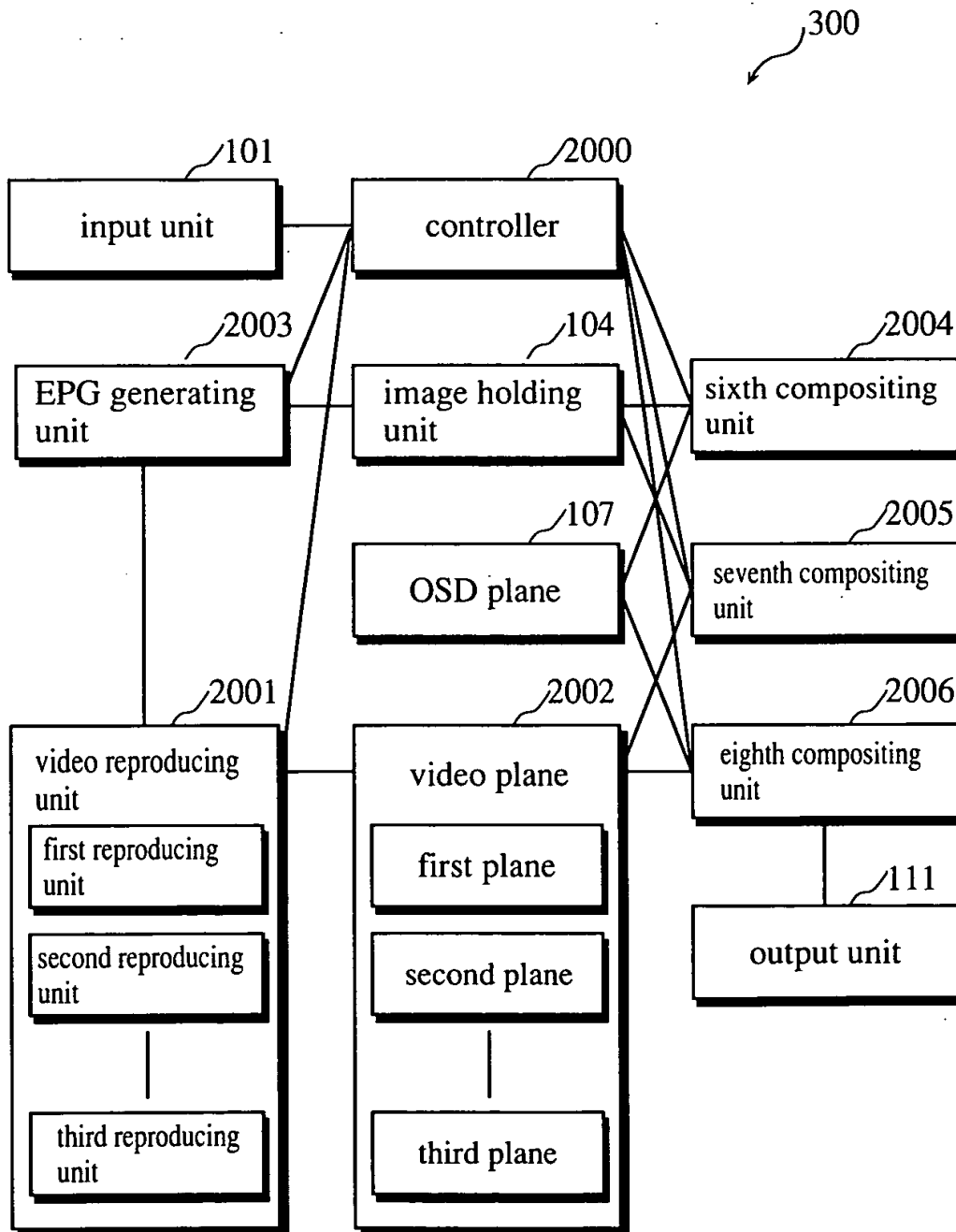


FIG.21

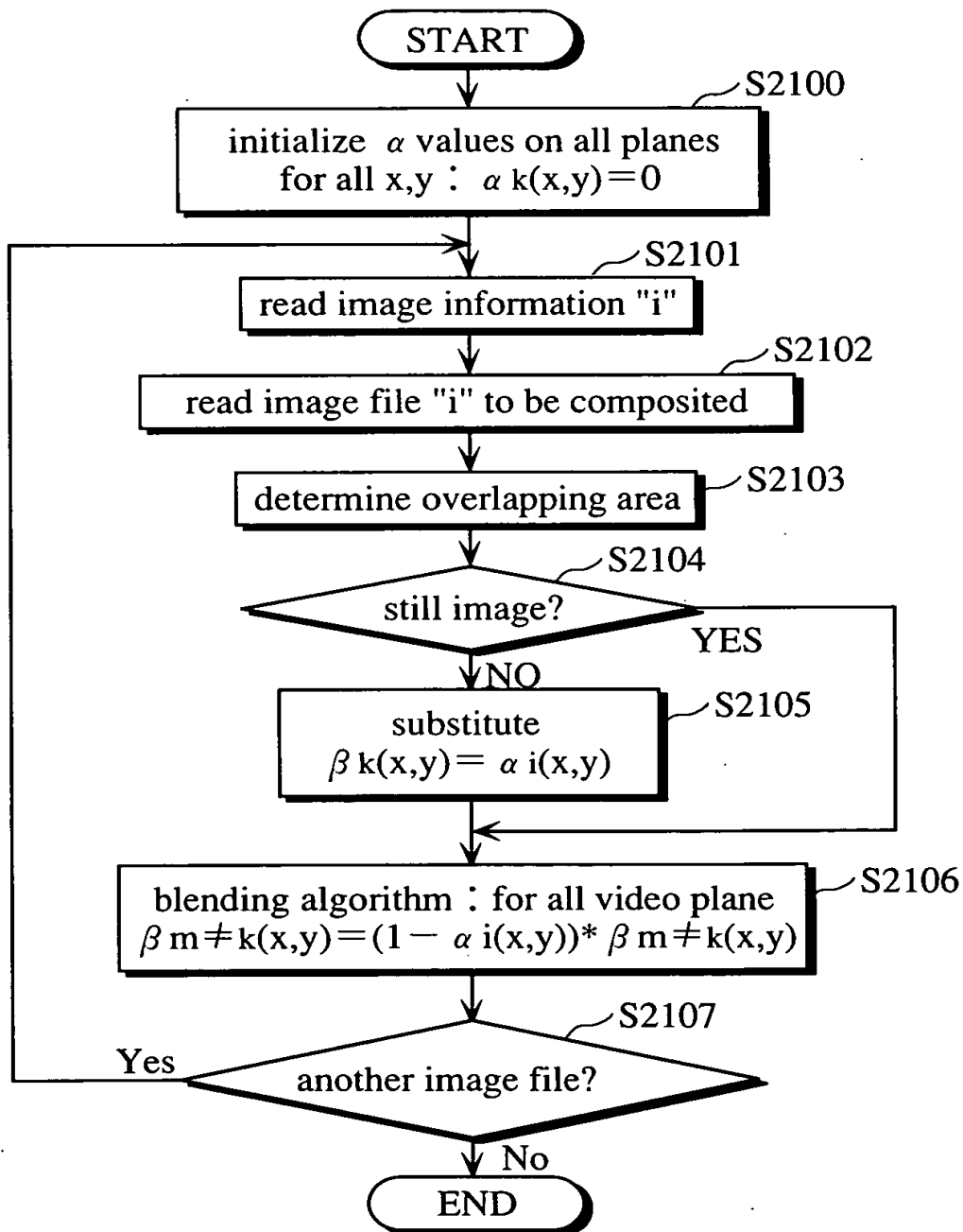


FIG.22

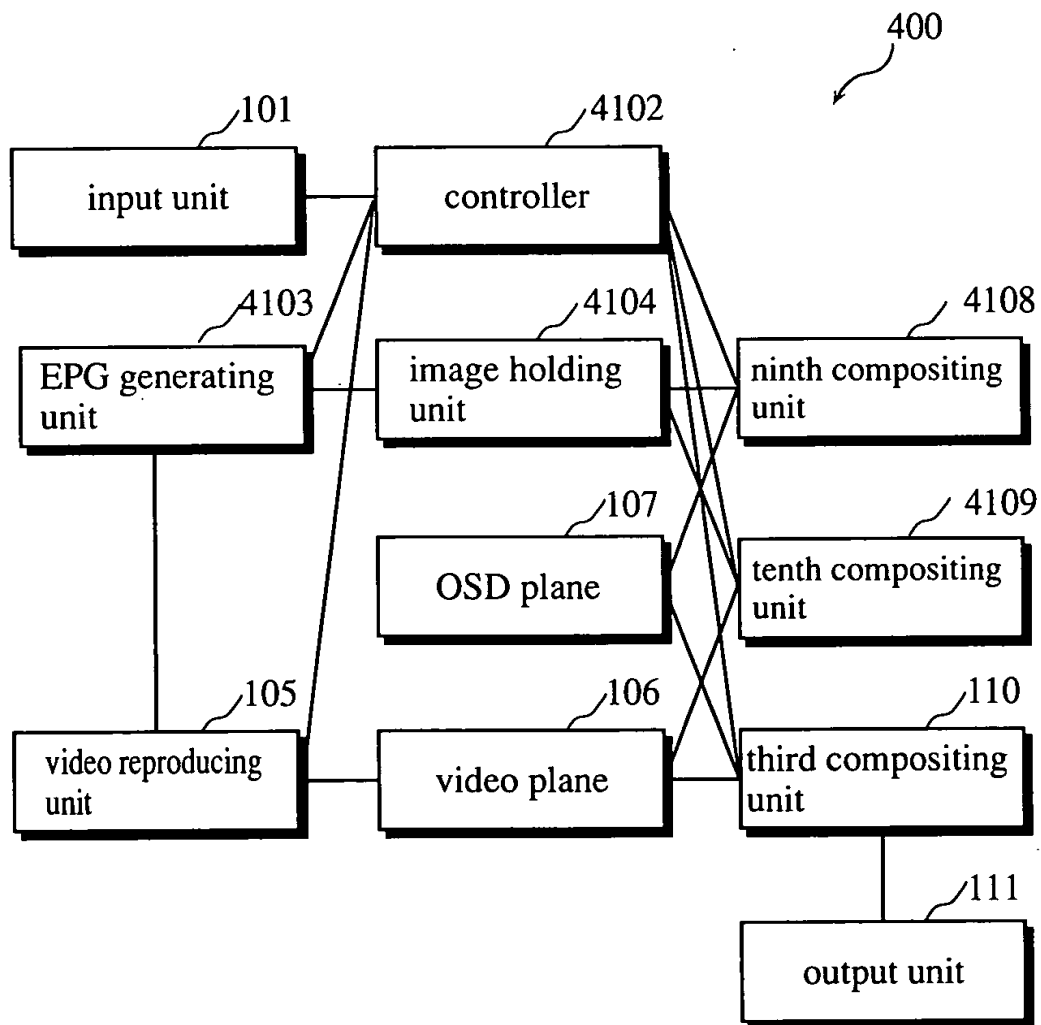


FIG. 23A

FIG. 23A

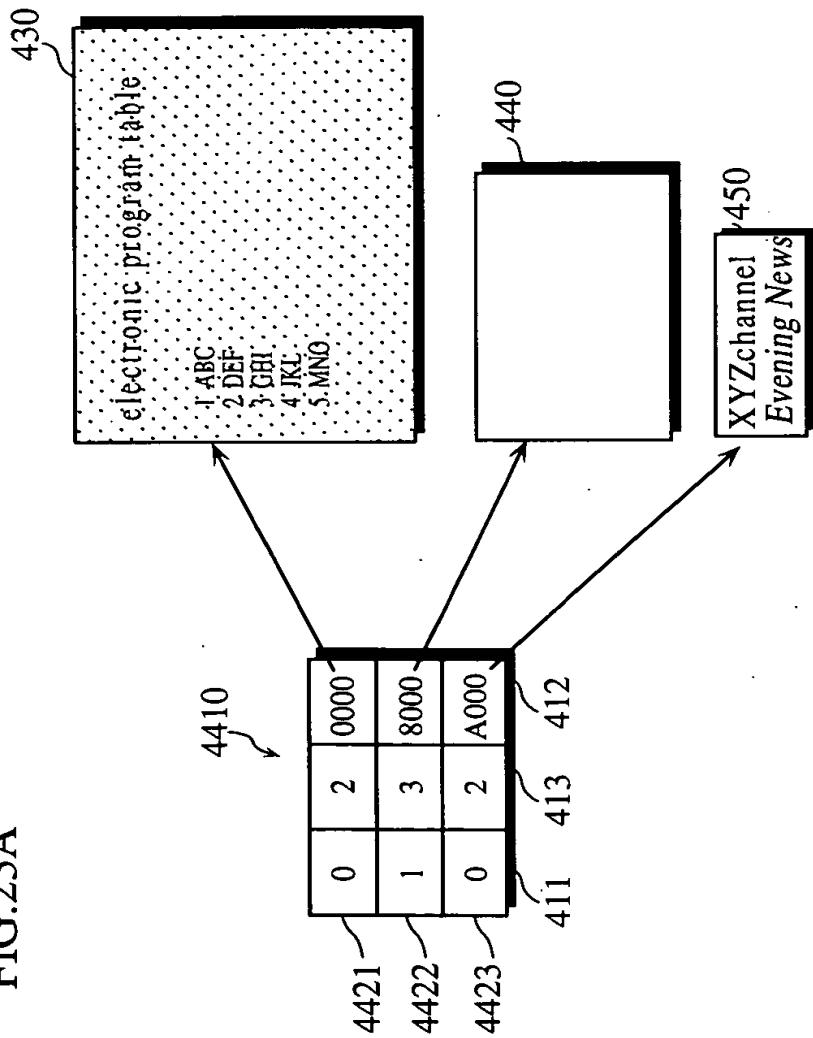


FIG. 23B

number	operation type
1	CLEAR
2	SRC
3	SRC_OVER
4	DST_OVER
5	SRC_IN
6	DST_IN
7	SRC_OUT
8	DST_OUT

FIG.24

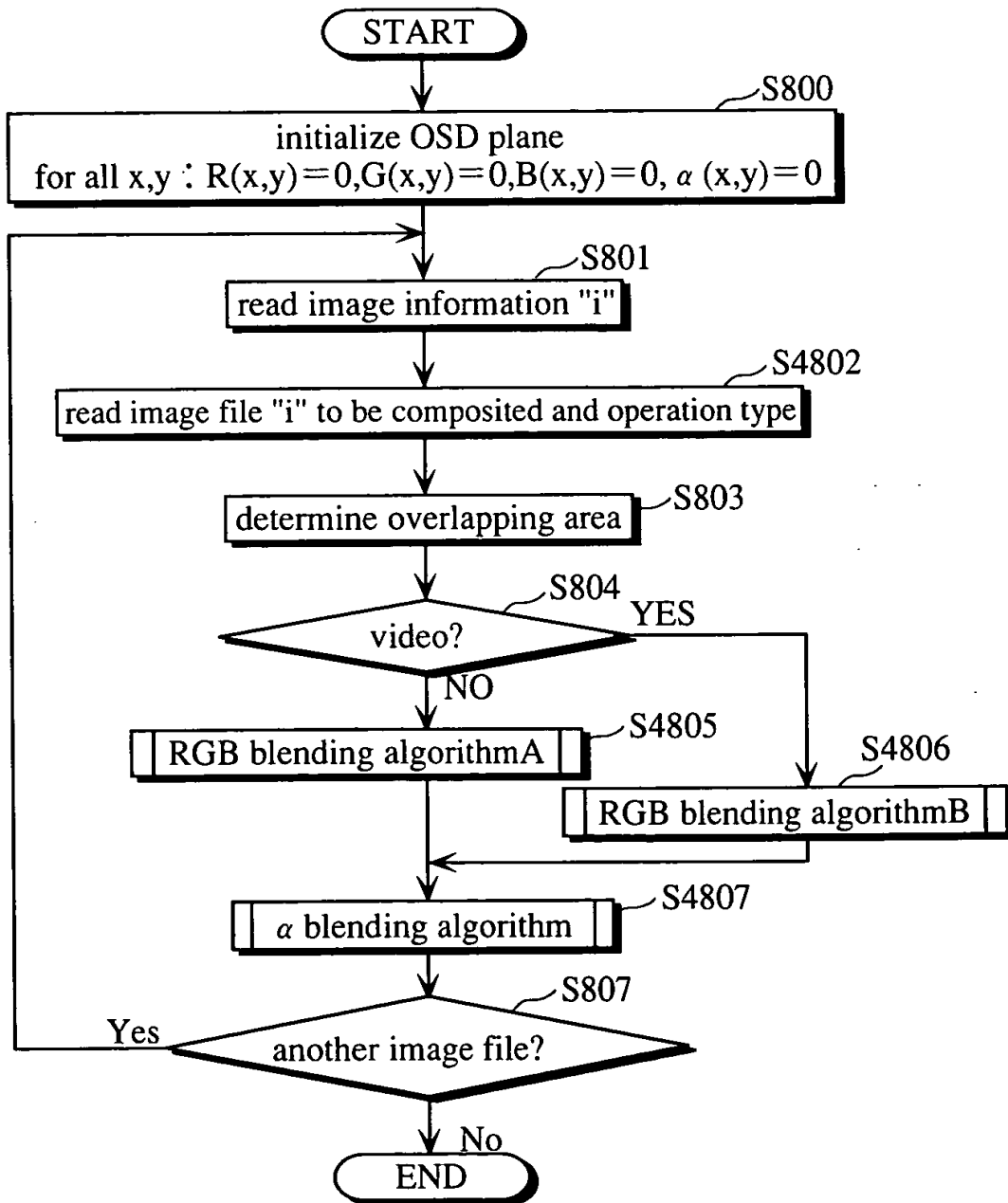


FIG.25

operation type	operation
CLEAR	$R=0, G=0, B=0$
SRC	$R = \alpha_i \cdot R_i, G = \alpha_i \cdot G_i, B = \alpha_i \cdot B_i$
SRC_OVER	$R = \alpha_i \cdot R_i + (1 - \alpha_i) \cdot R, G = \alpha_i \cdot G_i + (1 - \alpha_i) \cdot G,$ $B = \alpha_i \cdot B_i + (1 - \alpha_i) \cdot B$
DST_OVER	$R = R + (1 - \alpha) \cdot \alpha_i \cdot R_i, G = G + (1 - \alpha) \cdot \alpha_i \cdot G_i,$ $B = B + (1 - \alpha) \cdot \alpha_i \cdot B_i,$
SRC_IN	$R = \alpha \cdot \alpha_i \cdot R_i, G = \alpha \cdot \alpha_i \cdot G_i, B = \alpha \cdot \alpha_i \cdot B_i$
DST_IN	$R = \alpha_i \cdot R, G = \alpha_i \cdot G, B = \alpha_i \cdot B,$
SRC_OUT	$R = (1 - \alpha) \cdot \alpha_i \cdot R_i, G = (1 - \alpha) \cdot \alpha_i \cdot G_i,$ $B = (1 - \alpha) \cdot \alpha_i \cdot B_i$
DST_OUT	$R = (1 - \alpha_i) \cdot R, G = (1 - \alpha_i) \cdot G, B = (1 - \alpha_i) \cdot B$

FIG.26

operation type	operation
CLEAR	$R=0, G=0, B=0$
SRC	$R=0, G=0, B=0$
SRC_OVER	$R=(1-\alpha_i) \cdot R, G=(1-\alpha_i) \cdot G, B=(1-\alpha_i) \cdot B$
DST_OVER	$R=R, G=G, B=B$
SRC_IN	$R=0, G=0, B=0$
DST_IN	$R=\alpha_i \cdot R, G=\alpha_i \cdot G, B=\alpha_i \cdot B$
SRC_OUT	$R=0, G=0, B=0$
DST_OUT	$R=(1-\alpha_i) \cdot R, G=(1-\alpha_i) \cdot G, B=(1-\alpha_i) \cdot B$

FIG.27

operation type	operation
CLEAR	$\alpha = 0$
SRC	$\alpha = \alpha_i$
SRC_OVER	$\alpha = \alpha_i + (1 - \alpha_i) \cdot \alpha$
DST_OVER	$\alpha = \alpha + (1 - \alpha) \cdot \alpha_i$
SRC_IN	$\alpha = \alpha \cdot \alpha_i$
DST_IN	$\alpha = \alpha \cdot \alpha_i$
SRC_OUT	$\alpha = (1 - \alpha) \cdot \alpha_i$
DST_OUT	$\alpha = (1 - \alpha_i) \cdot \alpha$

FIG.28

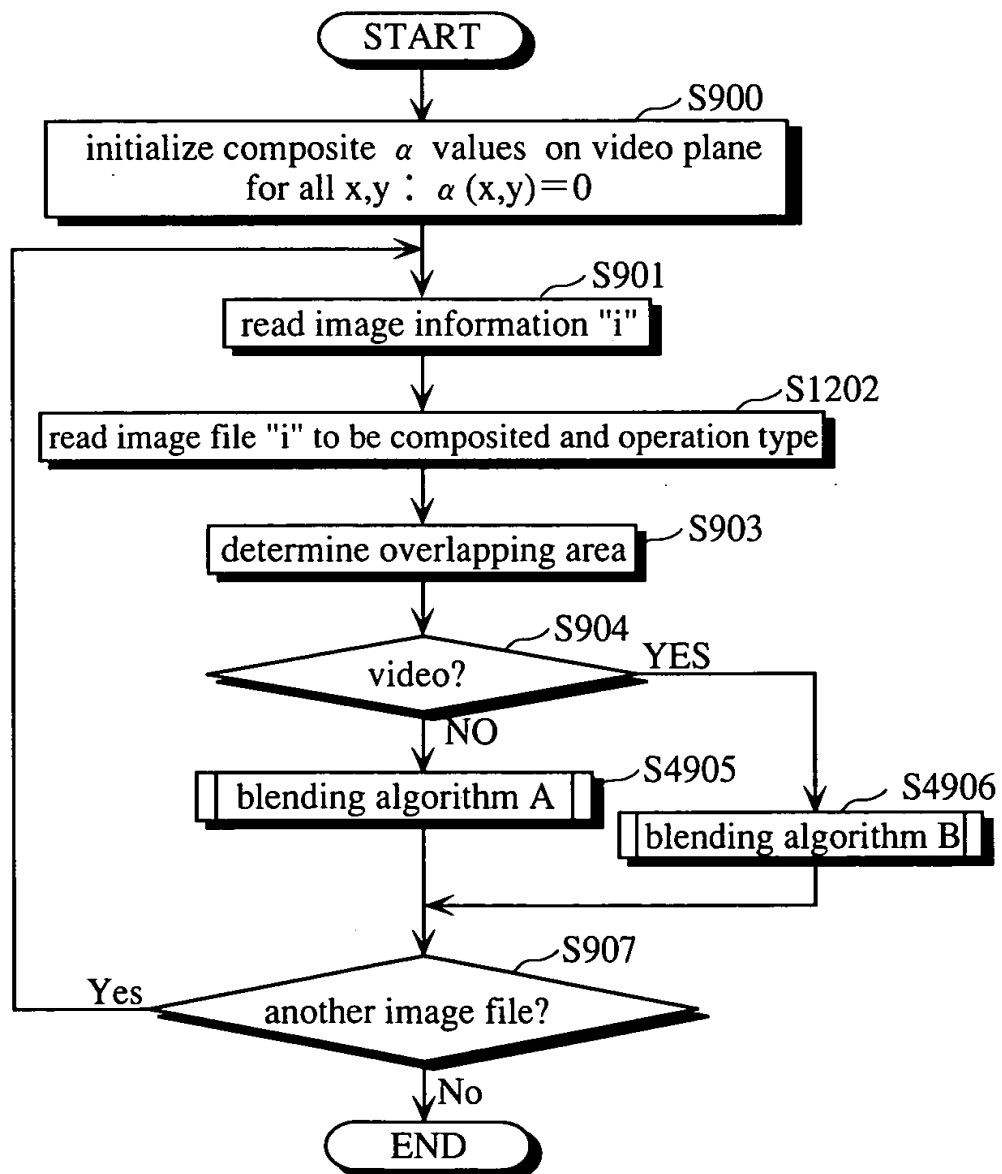


FIG.29

operation type	operation
CLEAR	$\alpha = 0$
SRC	$\alpha = 0$
SRC_OVER	$\alpha = \alpha \cdot (1 - \alpha_i)$
DST_OVER	$\alpha = \alpha$
SRC_IN	$\alpha = 0$
DST_IN	$\alpha = \alpha \cdot \alpha_i$
SRC_OUT	$\alpha = 0$
DST_OUT	$\alpha = (1 - \alpha_i) \cdot \alpha$

FIG.30

operation type	operation
CLEAR	$\alpha = 0$
SRC	$\alpha = \alpha_i$
SRC_OVER	$\alpha = \alpha_i$
DST_OVER	$\alpha = \alpha_i \cdot (1 - \alpha_{osd})$
SRC_IN	$\alpha = \alpha_i \cdot \alpha_{osd}$
DST_IN	$\alpha = 0$
SRC_OUT	$\alpha = (1 - \alpha_{osd}) \cdot \alpha_i$
DST_OUT	$\alpha = 0$

FIG.31

```

1      R=0 ;
2      G=0 ;
3      B=0 ;
4       $\alpha = 0$  ;
5       $\alpha v = 0$  ;
6      for (i=0 ; i<=N ; i++ ) {
7          if (VIDEO=component i) {
8              R,G,B update A
9               $\alpha v$  update A
10         } else {
11             R,G,B update B
12              $\alpha v$  update B
13         }
14          $\alpha$  update
15     }
16     R=R+  $\alpha v * R_v$  ;
17     G=G+  $\alpha v * G_v$  ;
18     B=B+  $\alpha v * B_v$  ;

```